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(54) Authenticating Label and It's Manufacture

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(71) Same as inventor

(57) 10 Claims

Notice: This application is as filed and may therefore contain an incomplete specification.



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TITLE

AN AUTHENTICATING LABEL AND ITS MANUFACTURE

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Abstract of Disclosure

An authenticating label is provided by adhering a substantially transparent peel strength adhesive to the underside of a protective layer, adhering an authenticating representation which will disintegrate if unsupported, to the underside of the peel strength adhesive layer, adhering a bonding material to the underside of the authenticating representation, and adhering a pressure sensitive adhesive layer to the bonding material and any uncovered underside of the peel strength adhesive layer. The bonding material bonds the pressure sensitive adhesive layer to the authenticating representation in a relatively stronger manner than that by which the peel strength adhesive layer adheres thereto, and the peel strength adhesive layer material, the bonding material, and the pressure sensitive adhesive layer material are selected to have similar melting and solubility characteristics, thereby rendering it very difficult if not impossible for the authenticating representation to be removed intact from an article once it has been applied thereto by the pressure sensitive adhesive.

2121921

This invention relates to a tamper evident, authenticating label and its manufacture.

It has already been proposed in, for example, United States Patent No. 3,858,977, dated January 7, 1975, Baird et al and United States Patent No. 5,009,486, dated April 23, 1991, Dobrowolski et al, to provide an optical interference authenticating laminate comprising at least one optical interference layer on a substrate.

It has also been proposed in United States Patents Nos. 4,705,300 and 4,705,356, dated November 10, 1987, Berning et al, to provide a thin film optically variable article having a substantial color shift with varying angle of light incidence and viewing, comprising a superstrate or a substrate, a multilayer interference coating on the substrate, and an optically thick, substantially transparent element carrying a colorant on the interference coating.

In one embodiment of Berning et al, 4,705,356, (see Figure 5a), where the article is to be used in connection with hot die transfers, a carrier sheet of polyethylene terephthalate polymer film is provided, a release coat is on the carrier sheet, a color carrying polymer hard coat forming an optically thick coating is on the release coat, an optical interference coating is on the hard coat, and an adhesive coating which is non-tacky at room temperature is on the optical interference coating. The adhesive layer is die bonded by heat and pressure to the substrate and then the carrier sheet, together with the release coat, is removed. In Figure 5b, of this Berning et

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al patent, the adhesive layer is a conventional pressure sensitive adhesive, and a release liner is provided on the pressure sensitive adhesive for removal when the pressure sensitive adhesive is to be secured by pressure to the substrate, which may be a piece of paper. If desired, the release coat may be eliminated if there is no desire to separate the polymer film from the polymer hard coat and the optical interference coating, and these members may be applied directly to the polymer film.

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While the authentication laminates of Baird et al, Dobrowolski et al, and Berning et al have been found to be useful, they are not tamper-proof in that no provision has been made to make it very difficult if not impossible for the multilayer interference coating to be transferred intact to another substrate.

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It has also been proposed in, for example, United States Patent No. 4,184,701, Franklin et al, to provide a tamper-proof label comprising, a transparent or translucent outer sheet having an information containing printed pattern on the inner surface thereof, a discontinuous, transparent, plasticized organic polymeric coating on the printed pattern, a coloured adhesive coating on the printed pattern and polymeric coating, and a continuous, pressure sensitive adhesive coating, for strong securement to a substrate, covering the exposed surfaces of the printed pattern and the polymeric coating. If an attempt is made to remove the label from a substrate to which it is secured by the pressure sensitive adhesive, the label delaminates resulting in the destruction of the printed matter and coloured adhesive, by leaving only portions thereof on the polymeric coating.

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2121921

5 While the label of Franklin et al is useful, for indicating that a label has been tampered with, the destruction of the printed matter and the coloured adhesive occurs in a regular, predetermined pattern with portions adhering to the substrate and other portions adhering to the outer sheet so that it is possible to reassemble the label. Furthermore, no provision is made to make it difficult if not impossible for printed matter to be transferred intact from one document to another.

10 There is a need for an authenticating label in which the representation cannot be delaminated from other components of the label for transfer to another article, and if delamination is attempted, will result in the release and disintegration of the authenticating representation in a random manner and to such an extent that reassembly cannot occur.

15 There is also a need for an authenticating label which, after attachment to an article, if an attempt is made to tamper with the label, will readily provide evidence as to whether such an attempt has or has not been made even though the authenticating portion of the label remains intact.

20 There is also a need for an authenticating label which, once attached to an article, provides an outer layer which can easily be removed but which cannot be re-applied in the original manner, and wherein it is difficult if not impossible for an authenticating portion of the label to be removed intact from the article for application to another article.

In the accompanying drawings which illustrate, by way of example,

2121921

In the accompanying drawings which illustrate, by way of example, an embodiment of the present invention,

Figure 1 is a diagrammatic side view of a protective layer being coated with a peel strength adhesive layer.

5 Figure 2 is an enlarged, diagrammatic side view of portion A,A-B,B, Figure 1, of the protective layer coated with the peel strength adhesive layer,

Figure 3 is a diagrammatic side view of an authenticating representation being transferred from authenticating material to the peel strength adhesive layer,

10 Figure 4 is an enlarged, side view of portion C,C - D,D, Figure 3, of the authenticating representation on the peel strength adhesive layer,

Figure 5 is a diagrammatic side of a pressure sensitive adhesive layer being applied to the authenticating representation,

15 Figure 6 is an enlarged side view of portion E,E-F,F, Figure 5, of the pressure sensitive adhesive layer on the authenticating representation,

20 Figure 7 is an enlarged side view of a backing strip being removed from the pressure sensitive adhesive, and

Figure 8 is an enlarged side view of the pressure sensitive adhesive being adhered to a portion of a document.

According to the present invention there is provided an authenticating label, comprising,

- 5 a) an outer, substantially transparent, protective layer,
- b) a substantially transparent, peel strength adhesive layer adhering to an underside of the protective layer,
- c) An authenticating representation, which will disintegrate if unsupported, adhering to an underside of the peel strength adhesive layer,
- 10 d) a bonding material strongly adhering to an underside of the authenticating representation, for bonding a pressure sensitive adhesive thereto, and
- e) a pressure sensitive adhesive layer,
 - 15 i) adhering to any underside portions of the peel strength adhesive layer not covered by the authenticating representation, and
 - ii) bonded to the underside of the authenticating representation by the bonding material in a relatively stronger manner than that by which the peel strength

adhesive layer adheres to the upper surface of the authenticating representation, and wherein,

5 f) the peel strength adhesive layer material, the bonding material, and the pressure sensitive adhesive layer material are selected to have similar melting and solubility characteristics.

In some embodiments of the present invention the adhesive of the peel strength adhesive layer is a peel strength adhesive which has had the adhesive value adjusted so that once the protective layer is peeled from the peel strength adhesive layer, it cannot be satisfactorily re-adhered thereto
10 using interfacial forces which originally held these members together.

The peel strength adhesive layer may be of a material selected from the group consisting of acrylic adhesives, urethane adhesives, and acrylated urethane adhesives.

15 The bonding material may be the residue remaining after an adhesive layer of a material selected from the group consisting of acrylic adhesive, urethane adhesive, and acrylated urethane adhesives has been directly adhered to the authenticating representation and then stripped therefrom.

Further according to the present invention there is provided a method of manufacturing an authenticating label, comprising

2121921

- a) adhering a peel strength adhesive layer to one side of a support layer,
- b) stripping, an authenticating representation with bonding material strongly adhering thereto, from a laminate comprising authenticating material, which will disintegrate if unsupported by the bonding material, and a support backing, and adhering the side of the authenticating representation not carrying the bonding material to the exposed side of the peel strength adhesive, and
- c) adhering a pressure sensitive adhesive layer to the authenticating representation by the bonding material, and to any peel strength adhesive material on the side of the authenticating representation and not covered thereby,
- d) the peel strength adhesive layer material, the bonding material, and the pressure sensitive adhesive layer being selected to have similar melting and solubility characteristics.

In this specification, similar melting and solubility characteristics means that,

- i. if an attempt is made to free the authenticating representation, by a process that includes heating any one of the components comprising the peel strength adhesive layer, the bond material or the pressure sensitive adhesive layer, for transferring the authenticating representation from one article to another, then the melting properties, that is, the

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viscosities at particular temperatures, or pressures of substances of the peel strength adhesive layer, the bonding material and the pressure sensitive adhesive layer will be sufficiently similar that the attempt to melt any one of these components will result in the other components being melted sufficiently for the authenticating representation to become unsupported and disintegrate, and

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- ii. if an attempt is made to free the authenticating representation, by a process that includes dissolving or dispersing any one of the components comprising the peel strength adhesive layer, the bonding material or the pressure sensitive adhesive layer, for transferring the authenticating representation from one article to another, then the solubility characteristics of substances of the peel strength adhesive layer, the bonding material and the pressure sensitive adhesive layer are sufficiently similar that the attempt to dissolve or disperse any one of these components will result in the other components being dissolved or dispersed sufficiently for the authenticating representation to become unsupported and disintegrate.

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In Figure 1, a substantially transparent, peel strength adhesive layer 1 is adhered to one side 2 of a substantially transparent, protective layer forming support layer 4, as the support layer 4 is being unreeled from a

2121921

supply roll 6 and taken up by a take-up roll 8.

The peel strength adhesive layer 1 is applied from a supply 10, comprising adhesive dissolved in a solvent, by an applicator roll 12. After the supply 10 has been applied to the support layer 4, the solvent is evaporated as the support layer passes over a heated bed 14 and the adhesive layer 1 is formed adhering to the support layer 4. Evaporated solvent is removed by the fume hood 16.

Figure 2 is an enlarged view of the portion A,A-B,B of the support layer 4 with the peel strength adhesive layer 1 adhering thereto.

In Figure 3, the take-up roll 8 (Figure 1) now becomes a supply roll 18, authenticating representations 19, with bonding material 20 strongly adhering to them, are stamped and stripped from a roll of laminate 22, comprising, authenticating material which will disintegrate if unsupported, bonding material, and a release backing. The authenticating representations 19 are, in this embodiment stamped from a multilayer optical interference coating on to the peel strength adhesive layer 1, by a hot foil stamp 24, as the supply roll 18 passes the support layer 1 (Figure 2) with the peel strength adhesive layer 4 thereon, to a take-up roll 26 (Figure 3). After the authenticating representations 19 have been stamped on the peel strength adhesive layer 1 the release backing, together with any remaining multilayer optical interference coating from which the authenticating representations have been stamped, is stripped from the authenticating representations 19 and taken up on a take-up roll 28. Stripping the release backing from the

authenticating representations 19 leaves, as is shown more clearly in Figure 4, the authenticating representations 19, with bonding material 20 thereon, adhering to the peel strength adhesive layer 1 on the support layer 4.

5 In this embodiment, the release backing is coated with the same peel strength adhesive material as that used for the peel strength adhesive layer 1. When the release backing is stripped from the authenticating representations 19, residual particles of the peel strength adhesive remain strongly attached to the authenticating representations 19 to form the bonding material 20, while the bulk of the peel strength adhesive is taken 10 up, with the release backing, on the take-up roll 28.

The take-up roll 26 (Figure 3) is then used, as shown in (Figure 5) as a supply roll 30.

15 In Figure 5, a pressure sensitive layer 32 (Figure 6) is adhered to the bonding material 20. The laminate shown in Figure 4 is fed by the supply roll 30, underneath a roll 34 of pressure sensitive adhesive layer 32 which is sandwiched between two release backings 36 and 38, to a take-up roll 39. The laminate from the supply roll 30 is fed beneath the roll 34, pressure sensitive adhesive, carried by the release backing 38 but with the release backing 36 removed and taken up on a take-up roll 40, is fed onto and into 20 direct contact with, the bonding material 20 and both are adhesively bonded together by heated pressure rollers 42 and 44. It should be noted that, if as is shown in Figure 6, the authenticating representations do not cover all of the peel strength adhesive layer 1, then the pressure sensitive adhesive layer

32 will also adhere to the uncovered portions of the peel strength adhesive layer 1.

5 If desired, tear perforations 46 and 48 (Figure 6) may be provided by means (not from) so that individual laminates carrying one authenticating representation 19 can readily be separated from one another as authenticating labels.

10 As shown in a representative manner in Figures 7 and 8, when an individual laminate is to be applied to an article, 50 (Figure 8) the release backing 38 is peeled away to the perforation and the pressure sensitive adhesive layer 32 thus revealed is bonded by a stamp 52 to the article 50 and then torn from the remainder. In practice, these steps are carried out in a known manner in an automated process.

15 The peel strength adhesive layer material 1, the protective layer 4, and the bonding material 20, are selected to have similar melting and solubility characteristics.

From this it will be seen that the process provides an authenticating label comprising

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- a) an outer, substantially transparent, protective layer 4,
- b) a substantially transparent, peel strength adhesive layer 1, adhering to an underside of the protective layer 4,
- c) an authenticating representation 19, which will disintegrate if unsupported, adhering to an underside of the peel strength

2121921

adhesive layer 1,

5 d) a bonding material 20 strongly adhering to an underside of the authenticating representation 19, for bonding a pressure sensitive adhesive thereto,

10 e) a pressure sensitive adhesive layer 4,

 i. adhering to any underside portions of the peel strength adhesive layer 1 not covered by the authenticating representation, and

 ii. bonded to the underside of the authenticating representation 19 by the bonding material 20 in a relatively stronger manner than that by which the peel strength adhesive layer adheres to the upper surface of the authenticating representation 20, and wherein,

15 f) the peel strength adhesive layer material, the bonding material, and the pressure sensitive adhesive layer material are selected to have similar melting and solubility characteristics.

20 In this embodiment, the adhesive of the peel strength adhesive layer 1, is a peel strength adhesive which has had the adhesive value adjusted so that once the protective layer 4 is peeled from the peel strength adhesive layer 1 it cannot be satisfactorily re-adhered thereto using interfacial forces which originally held these members together.

The peel strength adhesive layer 1 may be selected from the group consisting of acrylic adhesives, urethane adhesives, and acrylated urethane adhesives, provided that it has similar melting and solubility characteristics

as the bonding material 20 and the pressure sensitive adhesive layer 32.

The protective layer 4 may be a polyester web.

While a multilayer optical interference authenticating representation 19 is used in this embodiment, it may also comprise or include any of the 5 following, micro-printing borders, logos, serial numbers and ultra violet detectable representations.

The bonding material 20 may be the residual material remaining on the authenticating representation after an adhesive layer of an adhesive selected from the group consisting of acrylic adhesives, urethane adhesives and acrylated urethane adhesives, provided that it has similar melting and solubility characteristics as the peel strength adhesive layer 1 and the pressure sensitive adhesive layer 32.

15 The pressure sensitive adhesive layer 32 may be an adhesive selected from the group consisting of acrylic adhesives, urethane adhesives, provided that it has similar melting and solubility characteristics as the peel strength adhesive layer 1 and the bonding material 20.

20 In some embodiments of the present invention, the peel strength adhesive layer 1 and the pressure sensitive adhesive layer 32 are scored or "kiss-cut" to further impede removal of the authenticating representation intact.

WE CLAIM

1. An authenticating label, comprising,
 - a) an outer, substantially transparent, protective layer,
 - b) a substantially transparent, peel strength adhesive layer adhering to an underside of the protective layer,
 - c) an authenticating representation, which will disintegrate if unsupported, adhering to an underside of the peel strength adhesive layer,
 - d) a bonding material strongly adhering to an underside of the authenticating representation, for bonding a pressure sensitive adhesive thereto,
 - e) a pressure sensitive adhesive layer,
 - i. adhering to any underside portions of the peel strength adhesive layer not covered by the authenticating representation, and
 - ii. bonded to the underside of the authenticating representation by the bonding material in a relatively stronger manner than that by which the peel strength adhesive layer adheres to the upper surface of the authenticating representation, and wherein,
 - f) the peel strength adhesive layer material, the bonding material, and the pressure sensitive adhesive layer material are selected to have similar melting and solubility characteristics.

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2. A label according to claim 1, wherein the adhesive of the peel strength adhesive layer is a peel strength adhesive which has had the adhesive value adjusted so that once the protective layer is peeled from the peel strength adhesive layer, it cannot be satisfactorily re-adhered thereto using interfacial forces which originally held these members together.
3. A label according to claim 1, wherein the peel strength adhesive layer is of a material selected from the group consisting of acrylic adhesives, urethane adhesives, and acrylated urethane adhesives.
4. A label according to claim 1, wherein the pressure sensitive adhesive layer is of a material selected from the group comprising acrylic adhesives, urethane adhesives, and acrylated urethane adhesives.
- 10 5. A label according to claim 1, wherein the bonding material is the residue remaining after an adhesive layer of a material selected from the group consisting of acrylic adhesives, urethane adhesives, and acrylated urethane adhesives has been directly adhered to the authenticating representation and then stripped therefrom.
- 15 20 6. A method of manufacturing an authenticating label,

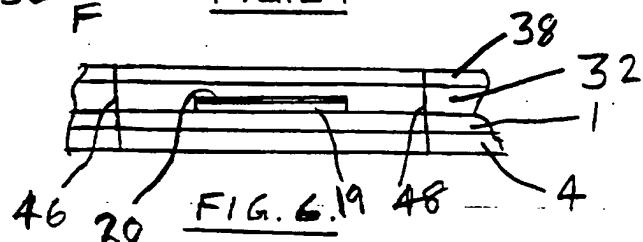
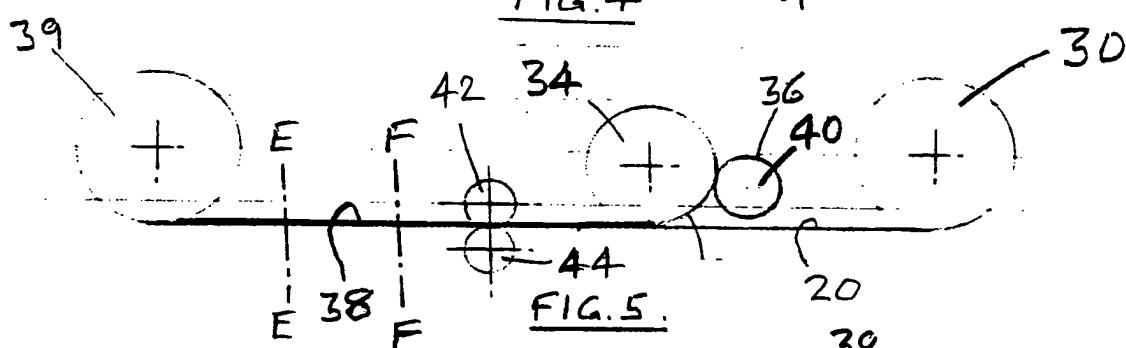
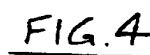
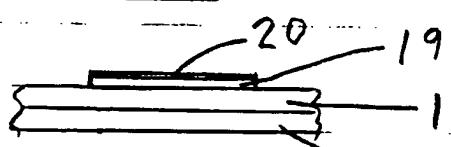
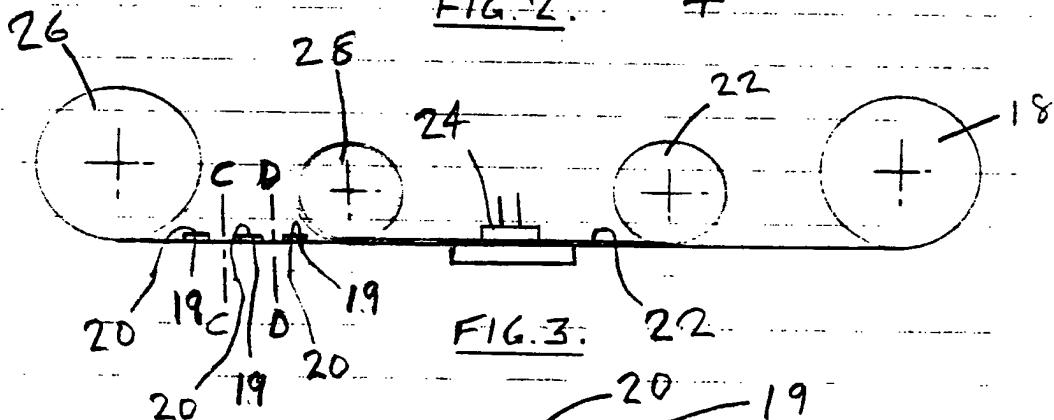
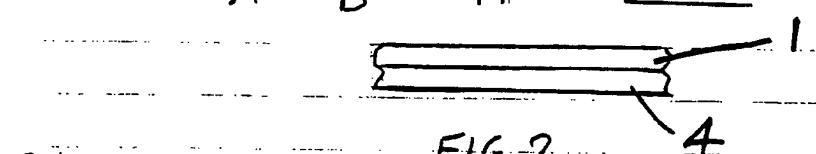
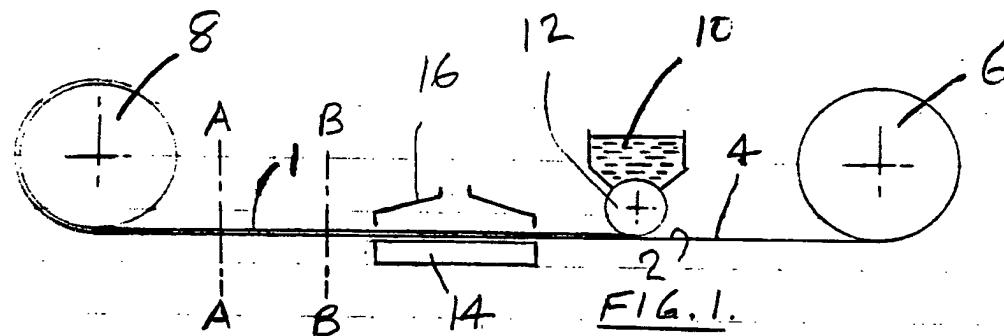
comprising

- a) adhering a peel strength adhesive layer to one side of a support layer.
- b) stripping an authenticating representation with bonding material strongly adhering thereto, from a laminate, comprising, authenticating material which will disintegrate if unsupported, bonding material, and a support backing, and adhering the side of the authenticating representation not carrying the bonding material to the exposed side of the peel strength adhesive, and
- c) adhering a pressure sensitive adhesive layer to the authenticating representation by the bonding material, and to any peel strength adhesive material on the side of the authenticating representation and not covered thereby,
- d) the peel strength adhesive layer material, the bonding material, and the pressure sensitive adhesive layer being selected to have similar melting and solubility characteristics.

7. A method according to claim 6, wherein the adhesive of the peel strength adhesive layer is a peel strength adhesive which has had the adhesive value adjusted so that once the protective layer is peeled from the peel strength adhesive layer, it cannot be satisfactorily re-adhered thereto using interfacial forces which originally held these members together.

8. A method according to claim 6, wherein the peel strength adhesive layer is of a material selected from the group consisting of acrylic adhesives, urethane adhesives, and acrylated adhesives.
- 5 9. A method according to claim 6, wherein the pressure sensitive adhesive layer is of a material selected from the group consisting of acrylic adhesives, urethane adhesives, and acrylated urethane adhesives.
- 10 10. A method according to claim 6, further comprising adhering an adhesive layer of a material directly to the authenticating representation, and then stripping the adhesive layer from the authenticating representation to leave a residue from the adhesive layer and forming the bonding material, the material of the adhesive layer being selected from the group consisting of acrylic adhesives, urethane adhesives, and acrylated urethane adhesives.
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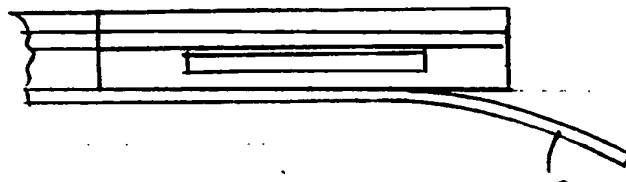


FIG. 7.

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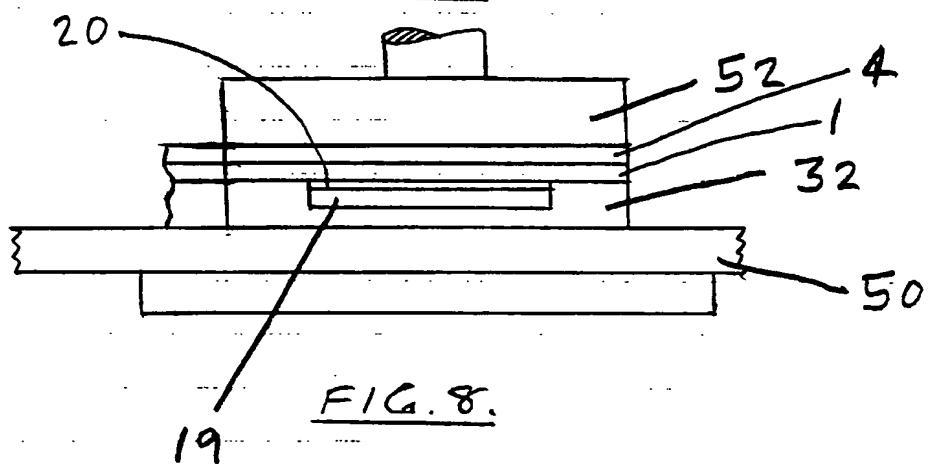


FIG. 8.

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